

CLAIMS

What is claimed is:

- 1 1. A transmitter for use in a communication system
2 comprising:
3 a signal folder for rearranging a signal wherein a plurality
4 of complex time samples are modulated on an in-phase carrier;
5 and
6 an envelope shaper for shaping the envelope of the signal.
- 1 2. A receiver for use in a communication system comprising:
2 a signal unfolder for reconstructing a signal comprising a
3 plurality of complex time samples modulated on an in-phase
4 carrier.
- 1 3. A communication system comprising:
2 a transmitter wherein a first signal is rearranged such that
3 a plurality of complex time samples are modulated on an in-
4 phase carrier and an envelope of the signal is shaped to create a
5 second signal; and
6 a receiver in communication with the transmitter through a
7 noisy channel for receiving said second signal comprising a
8 plurality of complex time samples modulated on an in-phase
9 carrier, wherein the receiver reconstructs said first signal from
10 the envelope shaped second signal.
- 1 4. A method for shaping an envelope a complex signal,
2 composed of a plurality of sample symbols with a real part and
3 imaginary part, by keeping the amplitude of each of said sample
4 symbols at or below a threshold value, said method comprising
5 the steps of:
6 rearranging a first signal in time domain;

7 obtaining the amplitude of one of said sample symbols of
8 said first signal;

9 comparing the amplitude of said one of said sample
10 symbols to said threshold value;

11 the amplitude and sign of real part of each of a second set
12 of a plurality of sample symbols to the amplitude and sign of the
13 real part of said one of said sample symbols, if the amplitude of
14 the real part of said one of said sample symbol is equal to or less
15 than said threshold value;

16 setting the imaginary part of each of a second set of a
17 plurality of sample symbols to the amplitude value equal to said
18 threshold value minus the amplitude of the real part said one
19 said sample symbols and wherein the sign of the imaginary part
20 of each of a second set of a plurality of sample symbols is the
21 sign of the real part of said one of said sample values, if the
22 amplitude of the real part of said one of said sample symbol is
23 equal to or less than said threshold value;

24 setting the sign of the real part of each of a second set of a
25 plurality of sample symbols to positive and the amplitude of real
26 part of each of a second set of a plurality of sample symbols to
27 half the amplitude of the real part of said one of said sample
28 symbols, if the amplitude of the real part of said one of said
29 sample symbol is greater than said threshold value; and

30 setting the sign of the imaginary part of each of a second
31 set of a plurality of sample symbols to negative and the
32 amplitude value of the imaginary part of each of a second set of
33 a plurality of sample symbols equal to one half the amplitude of
34 the real part said one said sample symbols, if the amplitude of
35 the real part of said one of said sample symbol is greater than
36 said threshold value.

1 5. The method of claim 4 wherein the steps of the method are
2 repeated for each of said plurality of sample symbols.

1 6. A method for shaping an envelope a complex signal,
2 composed of a plurality of sample symbols with a real part and
3 imaginary part, by keeping the amplitude of each of said sample
4 symbols at or below a threshold value, said method comprising the
5 steps of:

6 rearranging a first signal in time domain;

7 obtaining the amplitude of one of said sample symbols of
8 said first signal;

9 comparing the amplitude of said one of said sample
10 symbols to said threshold value;

11 the amplitude and sign of real part of each of a second set
12 of a plurality of sample symbols to the amplitude and sign of the
13 real part of said one of said sample symbols, if the amplitude of
14 the real part of said one of said sample symbol is equal to or less
15 than said threshold value;

16 setting the amplitude of the imaginary part of each of a
17 second set of a plurality of sample symbols to the square root of
18 (the square of said threshold value minus the square of the
19 amplitude of the real part of said one of said sample symbols)
20 and wherein the sign of the imaginary part of each of a second
21 set of a plurality of sample symbols is the sign of the real part of
22 said one of said sample values, if the amplitude of the real part
23 of said one of said sample symbol is equal to of less than said
24 threshold value;

25 setting the sign of the real part of each of a second set of a
26 plurality of sample symbols to positive and the amplitude of real
27 part of each of a second set of a plurality of sample symbols to

28 half the amplitude and of amplitude of the real part of said one of
29 said sample symbols, if the amplitude of the real part said one of
30 said sample symbol is greater than said threshold value; and

31 setting the sign of the imaginary part of each of a second
32 set of a plurality of sample symbols to negative and the
33 amplitude value of the imaginary part of each of a second set of
34 a plurality of sample symbols equal to one half the amplitude of
35 the real part said one said sample symbols, if the amplitude of
36 the real part said one of said sample symbol is greater than said
37 threshold value.

1 7. The method of claim 6 wherein the steps of the method are
2 repeated for each of said plurality of sample symbols.